Software Requirements Specification

1. Data Bank Shuttle Automated Function Executive (DBSAFE)

1.1 CLCS DBSAFE Introduction

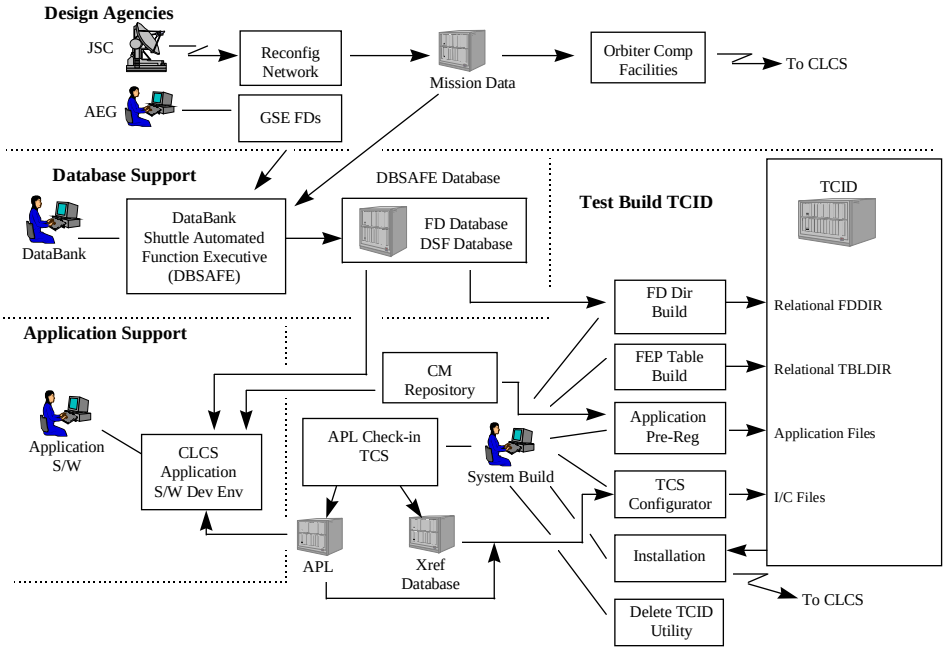
1.1.1 CLCS DBSAFE Overview

CLCS DBSAFE is a comprehensive Checkout and Launch Control System (CLCS) software capability that provides an interactive user interface supporting the evaluation, incorporation, and historical tracking of engineering changes to the FD Database. DBSAFE for CLCS is ported code baselined from the DBSAFE software developed for the replatform of CCMS Support Software to the Shuttle Data Center (SDC).

The core purpose of the CLCS DBSAFE is to provide the capability to maintain the FD Database. The FD Database is the portion of the CLCS DBSAFE database that contains the information on the measurements, commands, and system parameters needed for CLCS. The attributes of measurements and commands for the orbiters, payloads, ground support equipment, etc., are collected from the various design agencies, processed into a format that is compatible with CLCS, and stored in the FD Database using CLCS DBSAFE software. The data is then available to support the CLCS Application S/W Development Environment and Test Build processes.

CLCS DBSAFE also provides the capability to create and maintain TCID build specifications for the FD Directory Build process. CLCS DBSAFE validates and stores user specifications in the CLCS DBSAFE database. CLCS DBSAFE facilitates the generation of TCID specifications by automating the following functions:

- Assignment and traceability of Vehicle Configuration Names (VCN) and formats to Test Configuration Identifiers (TCID) based on a list of engineering provided by Ground Software Integration (GSI)
- Assignment of projected VCNs and formats to TCIDs based on matching each mission/TCID configuration to the effectivities of engineering changes in the FD Database
- Assignment and traceability of format revisions to each mission/TCID based on the format engineering defined in the Shuttle Data Tape (SDT)
- Support elimination of invalid/duplicate/overlapping addressing in the FD Database, that would otherwise cause errors in a TCID build



1.1.2 CLCS DBSAFE Operational Description

Surrounding the core capability of maintaining the FD Database, CLCS DBSAFE consolidates (into a single user interface) functions for evaluating, implementing, and tracking the history of engineering changes in the FD Database. These highly integrated management services consist of the following major functional areas:

- WAD/Tracker - supports creation and maintenance of the change authority and effectivities associated with each set of FD changes.
- * Evaluate Engineering - supports evaluation of data originating from the Master Measurements Data Base (MMDB) at Johnson Space Center (JSC).
- Implement - provides the core FD maintenance capability and supports the review and approval cycle for all changes to the FD Database.
- * MFSDT - supports conversion of MMDB data provided by JSC into the format required for inclusion into the FD Database.
- Baseline - supports consolidation of database records associated with several different engineering changes after the engineering is known to be effective for all future use of the affected FDs.
- TCID - facilitates generation of TCID Build specifications for extracting the subset of FD Database data applicable to a particular system checkout or shuttle mission.
- Cleanup - provides reports of database sizing parameters and identifies obsolete data to aid in maintaining acceptable performance levels within the CLCS DBSAFE database.
- CLCS DBSAFE Control - provides administrative functions for maintenance of data in certain CLCS DBSAFE validation tables and for definition of user permissions.

* Delivered but not used in Redstone.

CLCS DBSAFE software executes primarily on the LPS Software Development Network (LSDN) of Hewlett-Packard UNIX workstations. The CLCS DBSAFE menus and all user interface applications are written using Oracle*Forms. All reports are initiated from Oracle*Forms based applications accessed from the CLCS DBSAFE menu. The reports are written in Oracle*Report and are generated as background processes running on the LSDN workstation.

The CLCS DBSAFE main menu is initiated through the Relational Software Interface (RSI) system resident on the LSDN. RSI is one of several configuration management tools and techniques designed to fulfill the access control and data integrity requirements of CLCS applications. RSI also satisfies the Ad Hoc Query requirements for CLCS DBSAFE by providing read-only access to the CLCS DBSAFE database via either Oracle SQL*Plus or Oracle Browser.

All CLCS DBSAFE data is stored in an Oracle database located on a Digital UNIX server within the SDC. Data supporting the CLCS DBSAFE management services is located in the same physical database as the FD Database; the term "CLCS DBSAFE database" encompasses both. The distinction is important because CLCS DBSAFE supports a much higher degree of configuration management and control over the data within the FD Database. CLCS DBSAFE uses stored database procedures and triggers to satisfy many processing requirements. Communication between the software running on the LSDN and the database in the SDC is handled by Oracle SQL*Net.

1.2 CLCS DBSAFE Specifications

1.2.1 CLCS DBSAFE Groundrules.

The following groundrules and assumptions apply to the CLCS DBSAFE CSCI:

- Only GSE data will be utilized in CLCS DBSAFE for Redstone.
- For Redstone, CLCS DBSAFE will not provide an interface to the FD Database for the Data Fusion Editor.
- For Redstone, CLCS DBSAFE will not provide an interface to the FD Database for an "early registration" check of the FDs used by user applications.
- CLCS DBSAFE forms-based applications are written in Oracle*Forms version 4.0. There are no plans to upgrade to version 4.5 which is now available. The upgrade to version 5.0, projected for release later this year, may be assessed if time permits, but will not be implemented in the Redstone release.

The following are post-Redstone capabilities that may be implemented in the CLCS DBSAFE Redstone release, ONLY if there is sufficient time remaining after everything else is completed. Although these capabilities may be available in CLCS DBSAFE, it is NOT the plan for them to be supported by the Test Build and Control CSCI.

- Implement support for an 'Enumerated' Data Type
    - This will be similar to a digital pattern with an identified enumerated class (like a state class, but with more than 2 values); also applies to pseudo FDs
- Implement a 'persistence indicator' that is associated with pseudo FDs

1.2.2 CLCS DBSAFE Functional Requirements

Entity definitions, functional requirements, user interfaces, and report specifications are ported from the current CLCS DBSAFE requirements developed for the replatform of CCMS Support Software to the SDC.

Refer to document 84K00501 "CLCS DBSAFE Software Requirements and Design" for detailed requirements specifications. This document is the DBSAFE CLCS baseline and is accessible through the Web at the following address:

http://lpsweb.ksc.nasa.gov/CLCS/sei/cscis/csci-dsf.html

The following are the Redstone requirements. They have been incorporated in the above document.

- ~~The actual_sample_rate field for GSE discrete measurements will be deleted. (retain the design agency sample_rate).~~
- An indicator to identify HIMS with a Local Process Controller (LPC) will be added.
- Support for Data Fusion Function Designators will be provided:
    - Treat Fusion as a new data source in CLCS DBSAFE
    - Support all current measurement type/subtype combinations for Fusion data
    - Only support compiler and hardware data for Fusion data. (no addressing)

- User maintenance of Gateway definitions that use currently supported link indicators will be supported. (i.e., a new GSE Gateway can be defined by the end-user). This is possible due to the fact that Gateway processing is driven by a 'link indicator' rather than Gateway names.

- The times-2-to-the-buffer-length factor in the calculation of M-scaling will be removed.

- User specifications for mapping each FD Database Responsible System (RSYS), applicable to a TCID, to a TCID RSYS to support FD Directory Build will be validated and stored.

- Support for “build groupings” used to support FD Directory Build will be removed - Test Build no longer requires this capability.
    - Remove all columns and references to build groups from CLCS DBSAFE.

- The WORD_COUNT and WORD_NUMBER columns will be removed from the common compiler record. They will be added to the UCS address record as WORD_COUNT and WORD_NUMBER and to the MDM address record as SIO_ WORD_COUNT and SIO_WORD_NUMBER.

- The following columns will be removed from the common compiler data, but retained in 'legal tables' to support the TCS compiler interface:
    - TYPE_NUMBER
    - SUBTYPE_NUMBER
    - UNIT_NUMBER
    - STATE_CLASS_NUMBER

- The following columns and references to the following columns will be removed:
  - GLOBAL_CMD_FLAG
  - CDBFR_START_BIT
  - ~~ACTUAL_SAMPLE_RATE (for GSE discrete measurements)~~
  - SLOPE_1,
  - OFFSET_1,
  - START_COUNTS_2,
  - SLOPE_2,
  - OFFSET_2,
  - START_COUNTS_3,
  - SLOPE_3,
  - OFFSET_3,
  - START_COUNTS_4,
  - SLOPE_4,
  - OFFSET_4
  - COMMIT_CRITERIA_IND
  - LOG_CRITERIA
  - EMON_PAGE
  - SYSTEM_LOW_LIMIT
  - SYSTEM_HIGH_LIMIT
  - GOAL_LOW_LIMIT
  - GOAL_HIGH_LIMIT
  - CDS_LOW_LIMIT
  - CDS_HIGH_LIMIT
  - SYSTEM_LOW_FLAG
  - SYSTEM_HIGH_FLAG
  - GOAL_LOW_FLAG
  - GOAL_HIGH_FLAG
  - SIG_CHANGE_VAL
  - CDS_COMPRESS_VAL
  - FP_LIMIT_FLAG
  - SYS_EM_COMPARE_COND
  - SYS_EM_COMPARE_VAL
  - GOAL_EM_COMPARE_COND
  - GOAL_EM_COMPARE_VAL
  - CDS_EM_COMPARE_COND
  - CDS_EM_COMPARE_VAL
  - SYS_EM_STATE
  - GOAL_EM_STATE
  - CDS_EM_STATE
  - REMOTE_COMM_IND
  - LINK

- The following columns and references to the following columns will be modified:
  - Rename FEP to GATEWAY
  - Rename CDBFR_LENGTH to CONVERTED_LENGTH
    - Retain the algorithm for assigning the values.
  - Rename VALID_CDBFR_LENGTH to VALID_CONVERTED_LENGTH
  - Rename CDBFR_RESIDENT_IND to DATA_DIST_SRC
    - Retain the values that are stored in a look-up table and used to drive certain software tests.
    - Retain the software tests.
  - Rename EIU_NUMBER to GPC_EIU_NUMBER in the PCM address table.

- The following views will be removed. (they only supported SDC TCID Data Bank Build which creates an emulated IDS-I Data Bank):
  - COMPILER_DATA
  - SEGMENT_DATA
  - AM_HARDWARE_DATA
  - AS_HARDWARE_DATA
  - BTU_HARDWARE_DATA
  - DPM_HARDWARE_DATA
  - DPS_HARDWARE_DATA
  - DM_HARDWARE_DATA
  - DS_HARDWARE_DATA
  - PS_HARDWARE_DATA
  - SSA_HARDWARE_DATA
  - LINK_DATA
  - TCIDDB_FORMATS
  - TCIDDB_VCNS

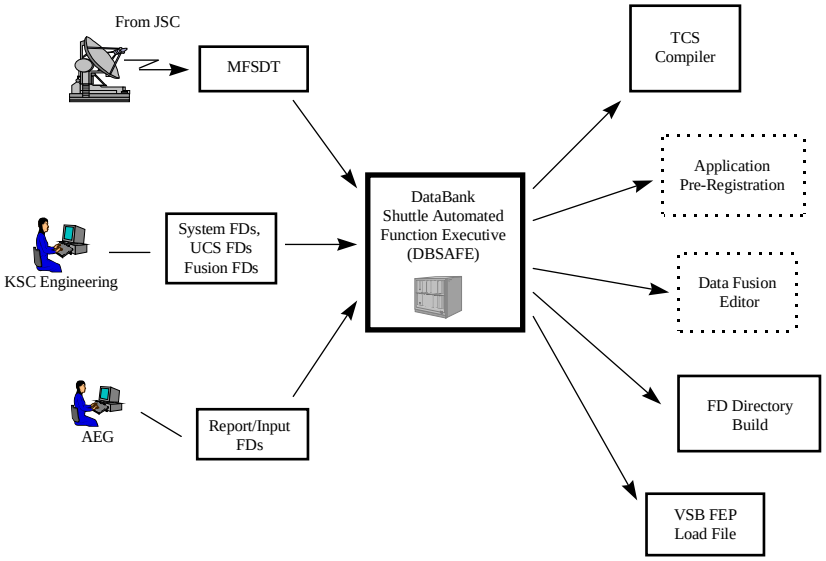
- The following views will be added to support CLCS Test Build:
  - RAW_VCN_PULL
  - RAW_VCN_PRIORITY_PULL
  - RAW_USER_PRIORITY_PULL
  - TCID_VCN_DATA
  - RAW_GSE_PULL
  - TCID_GSE_DATA

The capability to allow the user to maintain DISCRETE STATE and ENGINEERING UNIT Data will be added.
  - New forms will be created to allow maintenance of State Class Data and Eng Unit Data
  - There will be DB Revision Tracking associated with the data
  - An attempt to delete State Class Data or Eng Unit Data that is used by an existing FD will result in an error.

1.2.3 CLCS DBSAFE Performance Requirements

There are no specific performance requirements for CLCS DBSAFE.

1.2.4 CLCS DBSAFE Interfaces Data Flow Diagrams



The FD Database is a central repository for storing the attributes of all the measurements, commands, and system parameters needed to support hardware tests and shuttle missions. Data is supplied by several design agencies; among them are:

- JSC - Orbiter and payload data originates from the MMDB at JSC and must be converted into a format that is compatible with CLCS. JSC engineering first comes to KSC in the form of change paper, such as a Shuttle Software/Data Change Requests (DCR). CLCS DBSAFE provides tools to evaluate and incorporate these engineering changes into the FD Database via interactive processing. As the launch date approaches, JSC sends KSC a Multi-File Shuttle Data Tape (MFSDT) containing the MMDB data applicable to a particular shuttle mission. CLCS DBSAFE provides the capability to compare the data on the MFSDT to the associated data in the FD Database and create a delta report and/or update directives necessary to make the FD Database match the MFSDT data. These update directives facilitate interactive processing of the MFSDT data into the FD Database.

- AEG - The Automated Engineering Generator (AEG) software/database system is the source of information for GSE data. AEG is capable of providing reports listing CLCS compatible FD information. CLCS DBSAFE provides the capability to accept data from these reports as input to facilitate interactive processing of AEG data into the FD Database.

- KSC - Data Fusion FDs, System FDs, and FDs supporting the Utilities Control System (UCS) are examples of KSC engineering data. CLCS DBSAFE provides the capability to interactively process these FD specifications into the FD Database.

The FD Database is the source of all FD information supporting the CLCS system. The Compiler for Test Control Supervisor (TCS) applications access the FD Database to obtain compiler information about the FDs used by those procedures. The Fusion Editor may require access the FD Database to verify that Fusion FDs exist and are compatible with their definition in Fusion algorithms. A similar interface may also be required for other functions of the CLCS Development Environment to perform an "early registration" check of the FDs used by user applications.

CLCS DBSAFE also supports the FD Directory Build process of Test Build and Control. Automated processes facilitate creation of TCID Build specifications based on a specified list of engineering or based on matching engineering effectivities to a specified TCID configuration. These TCID build specifications are used by the FD Directory Build process to select, from the FD Database, the exact subset of data applicable to a particular test or shuttle mission.

CLCS DBSAFE also supports creation of the data file used to load the VSB Gateway~~FEP~~ with Biomed and Safing DECOM addressing. The list of Biomed and Safing measurements and formats are maintained using CLCS DBSAFE software. CLCS DBSAFE processes these lists against a specified MFSDT to create a VSB Gateway~~FEP~~ Load File report that is copied to a floppy disk and used to load the VSB Gateway~~FEP~~ for a specific mission.

1.3 CLCS DBSAFE Design Specification

1.3.1 CLCS DBSAFE Detailed Data Flow

1.3.2 CLCS External Interfaces

1.3.2.1 CLCS DBSAFE Message Formats

There are 3 types of messages (msg_type) generated during the execution of DBSAFE:

- DBS - DBSAFE unique messages
- HEY - Generic messages used by more than 1 database application (i.e., DBSAFE, RPRS, RSI).
- SPC - Replacement messages for default Oracle messages.

Each message has a message type, message code, and message text which may have 1 or more inserts that are used to qualify/clarify the condition that occurred.

An example of each of the 3 types of messages are:
DBS 22 ILLEGAL TABLE NAME $1 FOR SQL LOADER; $2 EXPECTED
HEY 10 RECORD ALREADY EXISTS; MUST QUERY RECORD TO UPDATE
SPC 40508 UNABLE TO INSERT RECORD; PRESS <DISPLAY ERROR> FOR MORE INFORMATION

1.3.2.2 CLCS DBSAFE Display Formats

The CLCS DBSAFE display formats are documented in the "CLCS DBSAFE Software Requirements and Design" document (84K00501). This document is the DBSAFE CLCS baseline and is accessible through the Web at the following address:

http://lpsweb.ksc.nasa.gov/CLCS/sei/cscis/csci-dsf.html

The User Interface section of this document contains the interface definitions for CLCS DBSAFE. Each interface definition details information found on the associated Oracle Form interface screen. The following is an example of data contained in a User Interface Definition:

The name of the interface is listed for each definition. The name of this particular interface is USER I/F - (WAD1) ADD WAD.

```
Interface Name : USER I/F - (WAD1) ADD WAD
```

A brief description of the interface is also provided. It usually includes a NOTE that states the name of the entity the information is available from.

```
--- DESCRIPTION -----------------------------------------------------------

    Definition of the user input parameters to the "Add WAD Data" function
      (WAD1).
    Comments may be input for the appropriate work group.
    NOTE:  All attributes are derived from the WORK_AUTHORIZATION entity
      unless otherwise noted.
```

A list of the items on the actual interface screen is then provided along with related detail information.

```
--- ATTRIBUTES ------------------------------------------------------------
    Name : WAD_NUMBER                              Domain :
           Opt : N           Format : CHAR         Length : 21
        Notes :
    Name : WAD_TYPE                                Domain : LEGAL_WAD.WAD_TYPE
           Opt : N           Format : CHAR         Length : 6
        Notes : Selectable from a list.
```

```
    Name : NASA_TO_DB_DATE                          Domain : DATE
           Opt : Y           Format : DATE          Length :
        Notes : Display only.
```

WAD_NUMBER, WAD_TYPE and NASA_TO_DB_DATE information is displayed on the interface screen associated with this example. Any information found or entered in the WAD_TYPE field must reside in the LEGAL_WAD entity. WAD_TYPE and WAD_NUMBER information is not optional ('Opt: N' relates this fact); thus, any records inserted or queried from the WORK AUTHORIZATION entity will always contain this information. A Note included with WAD_TYPE informs us that a list of values is available for the WAD_TYPE item. The NASA_TO_DB_DATE will be displayed on the screen, but it is provided (according to the Note) for information purposes only; it may not be changed in any way.

1.3.2.3 CLCS DBSAFE Input Formats

N/A.

1.3.2.4 CLCS DBSAFE Recorded Data

N/A.

1.3.2.5 CLCS DBSAFE Printer Formats

The CLCS DBSAFE report formats are documented in the "CLCS DBSAFE Software Requirements and Design" document (84K00501). This document is the DBSAFE CLCS baseline and is accessible through the Web at the following address:

http://lpsweb.ksc.nasa.gov/CLCS/sei/cscis/csci-dsf.html

The Reports Definition section of this document contains the report definitions for CLCS DBSAFE. Each report definition details information found on the associated output report. The following is an example of data contained in a Report Definition:

The name of the report is listed for each definition. The name of the report in the following example is 'Report - (REP11) WAD STATUS'.

```
Report Name : REPORT - (REP11) WAD STATUS
```

A brief description of the report is then provided.

```
--- DESCRIPTION -----------------------------------------------------------

    This report provides information on Work Authorization Documents (WAD)
      at specific milestones in the Assessment/Review/Implementation
      process.
    Selection criteria: only WADs "owned" by specified users or specified
        groups for specified Milestones.
    Sort: group by the LAST_NAME, MILESTONE
          order by WAD_TYPE, WAD_NUMBER
    NOTE: All attributes are derived from the WORK AUTHORIZATION entity
      unless otherwise noted.
```

All data output on the report is then described.

```
--- ATTRIBUTES ------------------------------------------------------------
    Name : WAD_NUMBER                               Domain :
           Opt : N           Format : CHAR          Length : 21
        Notes :
    Name : WAD_TYPE                                 Domain : LEGAL_WAD.WAD_TYPE
           Opt : N           Format : CHAR          Length : 6
        Notes :
```

1.3.2.6 CLCS DBSAFE Interprocess Communications (C-to-C Communications)

N/A.

1.3.2.7 CLCS DBSAFE External Interface Calls (e.g., API Calling Formats)

N/A.

1.3.2.8 CLCS DBSAFE Table Formats

The CLCS DBSAFE entity definitions are documented in the "CLCS DBSAFE Software Requirements and Design" document (84K00501). This document is the DBSAFE CLCS baseline and is accessible through the Web at the following address:

http://lpsweb.ksc.nasa.gov/CLCS/sei/cscis/csci-dsf.html

The Entity Definition section of this document contains the entity definitions for CLCS DBSAFE. Each entity represents an actual Oracle database table view. The entity definition details information about the view such as column name, type, and size. The following is an example of data contained within an entity definition:

The name of the entity is listed for each definition. CLCS ANALOG MEAS HD is the name of this particular example. It is also the name of the Oracle table's view containing the Analog Measurement Hardware Information.

```
Entity Name : CLCS ANALOG MEAS HD
```

Information relating to the amount of data within the table initially and over time is given by the volume lines.

```
Initial Volume :                  Average Volume :      17000
Maximum Volume :     22000        Annual Growth% :
```

A brief description of the entity is also provided.

```
--- Description - has Significance as -------------------------------------

    Each instance of ANALOG MEASUREMENT HARDWARE DATA refers to
    Hardware Data attributes whose existence is dependent on the Function
    Designator being a "Real" Analog Measurement Function Designator.
```

Each column in the view is then detailed in the Attribute Section.

```
--- Attributes ------------------------------------------------------------

    Name : FD_NAME                        Domain :
           Opt : N           Format : CHAR          Length : 10                *
    Name : VCN_NAME                       Domain : VCN_REV_DATA.VCN_NAME
           Opt : N           Format : CHAR          Length : 6                 *
    Name : VCN_BASE_REV                   Domain : VCN_REV_DATA.VCN_BASE_REV
           Opt : N           Format : CHAR          Length : 2                 *
    Name : VCN_MOD_REV                    Domain : VCN_REV_DATA.VCN_MOD_REV
           Opt : N           Format : CHAR          Length : 4
    Name : CAL_FD_NAME                    Domain :
           Opt : Y           Format : CHAR          Length : 10
    Name : M_SCALING                      Domain :
           Opt : N           Format : NUMBER        Length :
    Name : B_SCALING                      Domain :
           Opt : Y           Format : NUMBER        Length :
    Name : LOW_RANGE                      Domain :
           Opt : N           Format : NUMBER        Length : 11,6
    Name : HIGH_RANGE                     Domain :
           Opt : N           Format : NUMBER        Length : 11,6
    Name : LOW_COUNT                      Domain :
           Opt : Y           Format : NUMBER        Length : 10
    Name : HIGH_COUNT                     Domain :
           Opt : Y           Format : NUMBER        Length : 10
    Name : CONTROL_LOGIC                  Domain :
           Opt : Y           Format : CHAR          Length : 3
    Name : AMF_CONSTANT                   Domain :
           Opt : Y           Format : NUMBER        Length : 6,6

                                  * - Attributes in primary unique identifier
```

FD_NAME, VCN_NAME, VCN_BASE_REV, VCN_MOD_REV, CAL_FD_NAME, M_SCALING, B_SCALING, LOW_RANGE, HIGH_RANGE, LOW_COUNT, HIGH_COUNT, CONTROL_LOGIC, and AMF_CONSTANT are the column names. Any specified Domain information represents the fact that values contained in the column must also exist in the specified view. For columns whose data is optional, a 'N' will be displayed after Opt. A 'Y' means that data is not optional (it is mandatory) and there will be a value associated with it in every record in the view. The type of data that is stored within the column is denoted by the Format entry and its maximum length is specified by the Length information. Finally, any attribute flagged with an '*' can be assumed to be part of the view's unique identifier. Additional information may also be provided by the Relationship and Notes and Remarks section.

```
--- Relationships ------------------------------------------------------

    Each Occurrence Of This Entity :

                                  * - Relationships in primary unique identifier

--- Notes and Remarks --------------------------------------------------
```

1.3.3 CLCS DBSAFE Test Plan

CLCS DBSAFE testing will be executed in the SDC environment as indicated in the Operational Description. The testing will extensively utilize Oracle tools, such as, SQL*Plus and Oracle*Forms.

The objective of the test plan is to validate that all the stated Redstone requirements have been satisfied.

TEST 1
Objective: Validate that an indicator to identify HIMs with a Local Process Controller (LPC) has been added.

Test Cases:
a) Via SQL*Plus , a describe of the dbsafe.him_info table will be performed

Expected Results: An LPC_IND column will be present in the table.

b) From the Implement option of the CLCS DBSAFE Main Menu, the HIM Definition suboption will be selected. A HIM Info record will then be Added with Yes for the LPC_IND value.

Expected Results: (The Add will be verified with the Query capability of the HIM Definition form.) The HIM_INFO record will exist and will have an LPC_IND value of Yes.

c) The Added HIM record will then be Modified with the Modify Immediate capability to change the LPC_IND value to No.

Expected Results: (Again, the results will be verified with the Query capability.) The Added HIM_INFO record will still exist and it will now have an LPC_IND value of No.

TEST 2
Objective: Validate that support for Data Fusion Function Designators has been provided.

- Treat Fusion as a new data source
- Support all current measurement type/subtype combinations for Fusion data
- Only support compiler and hardware data for Fusion data. (no addressing)

Test Cases:
a) Via SQL*Plus , a select of all sources in SOURCE_INFO will be performed.

Expected Results: A new fusion source, FUSN, should be present.

b) From the Implement option of the CLCS DBSAFE Main Menu, the Compiler Definition suboption will be selected. An FD with a source of FUSN will be added.

Expected Results: (The Add will be verified with the Query capability of the Compiler Definition form.) A COMMON_CD_INFO record will exist for the FD and source will be FUSN.

c) From the Implement option of the CLCS DBSAFE Main Menu, the Hardware Definition suboption will be selected. Hardware information will be added to the FUSN FD.

Expected Results: (The Add will be verified with the Query capability of the Hardware Definition form.) A COMMON_HD_INFO record and an associated HD variant record will exist for the FD.

d) Address records will then be attempted to be added to the FUSN FD. From the Implement option of the CLCS DBSAFE Main Menu, an Address suboption will be selected. Address information for the FUSN FD will then be entered.

Expected Results: The address information will not be permitted to be entered.

TEST 3

Objective: Validate that user maintenance of Gateway definitions that use currently supported link indicators will be supported. (i.e., a new GSE Gateway can be defined by the end-user).

Test Cases:

a) From the TCID option of the CLCS DBSAFE Main Menu, the Gateway suboption will be selected. A Gateway record will then be Added.

Expected Results: (The Add will be verified with the Query capability of the Gateway form.) The Gateway record will exist.

TEST 4

Objective: Validate that the times-2-to-the-buffer-length factor in the calculation of M-scaling has been removed.

Test Cases:

a) Test by code inspection. Bring up text (.fmt) file for the SDC version of Cal FD Definition form. Inspect the code for calculating m_scaling.

Expected Results: The code contains the 2**BL calculation.

b) Test by code inspection. Bring up text (.fmt) file for the CLCS version of Cal FD Definition form. Inspect the code for calculating m_scaling.

Expected Results: The code does not contain the 2**BL calculation.

TEST 5

Objective: Validate that the user specifications for mapping each FD Database Responsible System (RSYS), applicable to a TCID, to a TCID RSYS to support FD Directory Build is being validated and stored.

Test Cases:

a) From the TCID option of the CLCS DBSAFE Main Menu, the TCID_RSYS suboption will be selected. A TCID RSYS record will then be Added.

Expected Results: (The Add will be verified with the Query capability of the TCID_RSYS form.) The TCID RSYS record will exist

TEST 6

Objective: Validate that support for "build groupings" used to support FD Directory Build has been removed.

- Remove all columns and references to build groups from CLCS DBSAFE.

Test Cases:

a) Via SQL*Plus , a describe will be performed on the FORMAT_DEFS table.

Expected Results: The BUILD_GROUPING column should no longer exist.

b) Via SQL*Plus , a describe will be performed on the GSI_TCID_VCNS table.

Expected Results: The BUILD_GROUPING column should no longer exist.

c) Via SQL*Plus , a describe will be performed on the LEGAL_BLD_GROUP view.

Expected Results: The view should no longer exist.

d) Via SQL*Plus , a describe will be performed on the TEMP_VCN_LIST table.

Expected Results: The BUILD_GROUPING column should no longer exist.

e) Via SQL*Plus , a describe of the VCN_GROUPS table will be performed.

Expected Results: The BUILD_GROUPING column should no longer exist.

f) From the CLCS DBSAFE Main Menu, the TCID option will be selected and the suboptions examined.

Expected Results: A BUILD_GROUP suboption will no longer exist.

TEST 7

Objective: Validate that the WORD_COUNT and WORD_NUMBER columns have been removed from the common compiler record, and that they have been added to the UCS address record as WORD_COUNT and WORD_NUMBER and to the MDM address record as SIO_ WORD_COUNT and SIO_WORD_NUMBER.

Test Cases:

a) Via SQL*Plus , a describe will be done on the COMMON_CD_INFO table.

Expected Results: The WORD_COUNT and WORD_NUMBER columns will no longer exist.

b) Via SQL*Plus , a describe of the UCS_AD_INFO table will be performed.

Expected Results: The WORD_COUNT and WORD_NUMBER columns will now exist.

c) Via SQL*Plus , a describe of the MDM_AD_INFO table will be performed.

Expected Results: The WORD_COUNT and WORD_NUMBER columns will now exist.

d) From the Implement option of the CLCS DBSAFE Main Menu, select the Address UCS

suboption. Add an address record with Word Count and Word Number information.

Expected Results: (The Add will be verified with the Query capability of the Address UCS form.) A UCS_AD_INFO record will exist for the FD and it will contain WORD_ NUMBER/WORD_COUNT information.

e) The Modify capability of the Address UCS form will then be used to modify the Word Count and Word Number values.

Expected Results: (The Modify will be verified with the Query capability of the Address UCS form.) The UCS_AD_INFO record will still exist for the FD and it will contain the modified WORD_NUMBER/WORD_COUNT information.

f) From the Implement option of the CLCS DBSAFE Main Menu, select the Address LDB/ Uplink suboption. Add an address record with SIO Word Count and SIO Word Number information.

Expected Results: (The Add will be verified with the Query capability of the Address LDB/Uplink form.) A MDM_AD_INFO record will exist for the FD and it will contain SIO_WORD_NUMBER/SIO_WORD_COUNT information.

g) The Modify capability of the Address LDB/Uplink form will then be used to modify the SIO Word Count and SIO Word Number values.

Expected Results: (The Modify will be verified with the Query capability of the Address LDB/Uplink form.) A MDM_AD_INFO record will still exist for the FD and it will contain the modified SIO_WORD_NUMBER/SIO_WORD_COUNT information.

TEST 8

Objective: The following columns will be removed from the common compiler data, but retained in 'legal tables' to support the TCS compiler interface:

- TYPE_NUMBER
- SUBTYPE_NUMBER
- UNIT_NUMBER
- STATE_CLASS_NUMBER

Test Cases:

a) Via SQL*Plus , a describe will be performed on the COMMON_CD_INFO table.

Expected Results: The TYPE_NUMBER, SUBTYPE_NUMBER, UNIT_NUMBER and STATE_CLASS_NUMBER columns will no longer exist.

b) Via SQL*Plus , a describe will be performed on the TYPE_INFO table.

Expected Results: The TYPE_NUMBER column will still exist.

c) Via SQL*Plus , a describe will be performed on the SUBTYPE_INFO table.

Expected Results: The SUBTYPE_NUMBER column will still exist.

d) Via SQL*Plus , a describe will be performed on the ENG_UNIT_INFO table.

Expected Results: The UNIT_NUMBER column will still exist.

e) Via SQL*Plus , a describe will be performed on the STATE_INFO table.

Expected Results: The STATE_CLASS_NUMBER column will still exist.

TEST 9

Objective: Validate the following columns and references to the following columns have been removed from the hardware data:

- GLOBAL_CMD_FLAG
- COMMIT_CRITERIA_IND
- LOG_CRITERIA
- EMON_PAGE
- SYSTEM_LOW_LIMIT
- SYSTEM_HIGH_LIMIT
- GOAL_LOW_LIMIT
- GOAL_HIGH_LIMIT
- CDS_LOW_LIMIT
- CDS_HIGH_LIMIT
- SYSTEM_LOW_FLAG
- SYSTEM_HIGH_FLAG
- GOAL_LOW_FLAG
- GOAL_HIGH_FLAG
- SIG_CHANGE_VAL
- CDS_COMPRESS_VAL
- FP_LIMIT_FLAG
- SYS_EM_COMPARE_COND
- SYS_EM_COMPARE_VAL
- GOAL_EM_COMPARE_COND
- GOAL_EM_COMPARE_VAL
- CDS_EM_COMPARE_COND
- CDS_EM_COMPARE_VAL
- SYS_EM_STATE
- GOAL_EM_STATE
- CDS_EM_STATE
- REMOTE_COMM_IND

Test Cases:

a) Via SQL*Plus , a describe will be performed on the COMMON_HD_INFO and all the hardware variant tables (ANALOG_MEAS_HD_INFO, ANALOG_STIM_HD_INFO, BTU_HD_INFO, DIGITAL_PATTERN_MEAS_HD_INFO, DIGITAL_PATTERN_STIM_HD_INFO, DISCRETE_MEAS_HD_INFO, DISCRETE_STIM_HD_INFO, PSEUDO_HD_INFO, SYSTEM_STATUS_HD_INFO).

Expected Results: None of the above listed columns should exist in these tables.

TEST 10

Objective: Validate that the following columns and references to the following columns have been removed from the calibration data:

- SLOPE_1,
- OFFSET_1,
- START_COUNTS_2,
- SLOPE_2,
- OFFSET_2,
- START_COUNTS_3,

- SLOPE_3,
- OFFSET_3,
- START_COUNTS_4,
- SLOPE_4,
- OFFSET_4

Test Cases:
a) Via SQL*Plus , a describe will be performed on the CALIBRATION_CD_INFO table.

Expected Results: None of the above listed columns should exist in these tables.

TEST 11
Objective: Validate that the following columns and references to the following columns have been removed from the compiler data:

- CDBFR_START_BIT
- LINK

Test Cases:
a) Via SQL*Plus , a describe will be performed on the GSE_AD_INFO, MDM_AD_INFO, PCM_AD_INFO and UCS_AD_INFO tables.

Expected Results: None of the above listed columns should exist in these tables.

TEST 12
Objective: Validate that the following columns and references to the following columns have been modified:

- Rename FEP to GATEWAY
- Rename CDBFR_LENGTH to CONVERTED_LENGTH
- Rename VALID_CDBFR_LENGTH to VALID_CONVERTED_LENGTH
- Rename CDBFR_RESIDENT_IND to DATA_DIST_SRC
- Rename EIU_NUMBER to GPC_EIU_NUMBER in the PCM address table.

Test Cases:
a) Via SQL*Plus , a describe will be performed on the CALIBRATION_CD_INFO and SYSTEM_STATUS_HD_INFO tables.

Expected Results: The FEP column will now be called GATEWAY.

b) Via SQL*Plus , a describe will be performed on the COMMON_CD_INFO table.

Expected Results: The CDBFR_LENGTH column will now be replaced by a CONVERTED LENGTH column.

c) Via SQL*Plus , a describe will be performed on the CALIBRATION_CD_INFO table.

Expected Results: The VALID_CDBFR_LENGTH column will now be replaced with a VALID_CONVERTED_LENGTH column.

d) Via SQL*Plus , a describe will be done on the SOURCE_INFO table.

Expected Results: The CDBFR_RESIDENT_IND column will now be replaced with a DATA_DIST_SRC column.

e) Via SQL*Plus , a describe will be done on the PCM_AD_INFO table.

Expected Results: The EIU_NUMBER column will now be replaced with a GPC_EIU_NUMBER column.

TEST 13
Objective: Validate that the following views have been removed:

- COMPILER_DATA
- SEGMENT_DATA
- AM_HARDWARE_DATA
- AS_HARDWARE_DATA
- BTU_HARDWARE_DATA
- DPM_HARDWARE_DATA
- DPS_HARDWARE_DATA
- DM_HARDWARE_DATA
- DS_HARDWARE_DATA
- PS_HARDWARE_DATA
- SSA_HARDWARE_DATA
- LINK_DATA
- TCIDDB_FORMATS
- TCIDDB_VCNS

Test Cases:
a) Via SQL*Plus , a describe will be performed on all of the above mentioned views.

Expected Results: The views will no longer exist.

TEST 14
Objective: Validate that the following views have been added to support CLCS Test Build:

- RAW_VCN_PULL
- RAW_VCN_PRIORITY_PULL
- RAW_USER_PRIORITY_PULL
- TCID_VCN_DATA
- RAW_GSE_PULL
- TCID_GSE_DATA

Test Cases:
a) Via SQL*Plus , a describe will be performed on all of the above mentioned views.

Expected Results: The views will now exist.

TEST 15
Objective: Validate the capability to allow the user to maintain DISCRETE STATE and ENGINEERING UNIT Data

- New forms will be created to allow maintenance of State Class Data and Eng Unit Data
- There will be DB Revision Tracking associated with the data
- An attempt to delete State Class Data or Eng Unit Data that is used by an existing FD will result in an error.

Test Cases:
a) From the DBSAFE Control option of the CLCS DBSAFE Main Menu, select the State Class suboption. Add a State Class record. Next, query in the added record and modify the State1 information. Go to the Implement Compiler Data form and use this State Class in a Compiler FD record. Return to the State Class form and attempt to delete the record.

Expected Results: The Add, Modify and Delete will be verified with the Query capability of the State Class form. DB Revision information will be associated with the record. The attempt to delete the State Class will fail as long as an FD exists using it.

b) From the DBSAFE Control option of the CLCS DBSAFE Main Menu, select the Eng Unit suboption. Add an Eng Unit record. Next, query in the added record and modify the Description information. Go to the Implement Compiler Data form and use this Eng Unit in a Compiler FD record. Return to the Eng Unit form and attempt to delete the record.

Expected Results: The Add, Modify and Delete will be verified with the Query capability of the Eng Unit form. DB Revision information will be associated with the record. The attempt to delete the Eng Unit will fail as long as an FD exists using it.